



Substitute Seq Listing I- 2001.004 US

<110> Schetters, Theodorus P. M.
Carcy, Bernard P. D.
Drakulovski, Pascal R.
Gorenflot, Andre F.

<120> Babesia canis vaccine

<130> I-2001.004 US

<140> 10/087,573

<141> 2002-02-28

<150> EP 01200816.5

<151> 2001-03-06

<160> 17

<210> 1

<211> 1135

<212> DNA

<213> Babesia canis

<220>

<221> CDS

<222> (75)..(500)

<400> 1

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tataataata aagg atg gag tcg aca tca aca acg acc aac ttt gtt gcc 110
Met Glu Ser Thr Ser Thr Thr Thr Asn Phe Val Ala
1 5 10

gag aac cgt ccc acc ttt ggt gag acg ttt gat gtg atg agg gaa gct 158
Glu Asn Arg Pro Thr Phe Gly Glu Thr Phe Asp Val Met Arg Glu Ala
15 20 25

ttg ctt cgt gta aag tcc tct gaa cgc ttg gca atg ctc aga gcg ctt 206
Leu Leu Arg Val Lys Ser Ser Glu Arg Leu Ala Met Leu Arg Ala Leu
30 35 40

gca gga atg tgc ggt cac cgc gtc ctt cct ggc act ggt gct tct gcg 254
Ala Gly Met Cys Gly His Arg Val Leu Pro Gly Thr Gly Ala Ser Ala
45 50 55 60

ata gcg gca acg gta acc cca aag ggg gct tcg atg aag ctt aaa cca 302
Ile Ala Ala Thr Val Thr Pro Lys Gly Ala Ser Met Lys Leu Lys Pro
65 70 75

ccg cgt ccg cag tca acg aag tct ccg gag ctc agg gag ctg tca cgg 350
Pro Arg Pro Gln Ser Thr Lys Ser Pro Glu Leu Arg Glu Leu Ser Arg
80 85 90

aag att cgc gaa atg aat aag act ata agt cag gaa tca gct cgg gta 398
Lys Ile Arg Glu Met Asn Lys Thr Ile Ser Gln Glu Ser Ala Arg Val
95 100 105

aac cac cgg ttg ccg gaa ggc cac cct ctc tta gag aag cgg gca gaa 446
Asn His Arg Leu Pro Glu Gly His Pro Leu Leu Glu Lys Arg Ala Glu
110 115 120

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tat ttt cgt cac ctt aga tct ctt aag agc caa gga gtc aat aga ctc 494
Tyr Phe Arg His Leu Arg Ser Leu Lys Ser Gln Gly Val Asn Arg Leu
125 130 135 140

atc taa gaaggcacta cgtaggtacc gtgcctctat gaggaatacag aaccgactag 550
Ile

tgcacaatag acgaccagtt ctaccaaagg tagagcctga ctctaataccta ccattcggcc 610
agcgacggag tcgcatgaca acgtggaatc ttagaccacg ccggacgggt tatccgtcaa 670
atgggtacttt ggcagttacg gaactcctga tctcgattta tagatcaaac ttctacacct 730
tgaaggtggt cgaggaaggg agatgtacgt gctgcaacac ccataaggag caagctttgc 790
tactcctatc cggttacctc cagctatatc gtgcactgca ctcagttgga aggtctgtat 850
tcgtagaata ctgcaaaacc aggatatgcg tcgaggcacg cctcaccgga ctacgtccga 910
gggtgaccct aacgggctgc tgaactaggt tcagccagcg cttcctgtga gtatgtcatt 970
ccgggtcctt cggggcccg gccagtttcg actggtgtag gtttgcccta ctagagtact 1030
tgcgacgccg aagcgctcc gttcaaaaga acgcgcaagc cctagcagag aaatgcgagg 1090
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<210> 2
<211> 141
<212> PRT
<213> Babesia canis

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Thr Phe Gly Glu Thr Phe Asp Val Met Arg Glu Ala Leu Leu Arg Val
20 25 30

Lys Ser Ser Glu Arg Leu Ala Met Leu Arg Ala Leu Ala Gly Met Cys
35 40 45

Gly His Arg Val Leu Pro Gly Thr Gly Ala Ser Ala Ile Ala Ala Thr
50 55 60

Val Thr Pro Lys Gly Ala Ser Met Lys Leu Lys Pro Pro Arg Pro Gln
65 70 75 80

Ser Thr Lys Ser Pro Glu Leu Arg Glu Leu Ser Arg Lys Ile Arg Glu
85 90 95

Met Asn Lys Thr Ile Ser Gln Glu Ser Ala Arg Val Asn His Arg Leu
100 105 110

Pro Glu Gly His Pro Leu Leu Glu Lys Arg Ala Glu Tyr Phe Arg His
115 120 125

Leu Arg Ser Leu Lys Ser Gln Gly Val Asn Arg Leu Ile
130 135 140

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<210> 3
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 <212> DNA
 <213> Babesia canis

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 <221> CDS
 <222> (75)..(929)

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 Met Glu Ser Thr Ser Thr Thr Thr Asn Phe Val Ala 10
 gag aac cgt ccc acc ttt ggt gag acg ttt gat gtg atg agg gaa gct 158
 Glu Asn Arg Pro Thr Phe Gly Glu Thr Phe Asp Val Met Arg Glu Ala 15
 15 20 25
 ttg ctt cgt gta aag tcc tct gaa cgc ttg gca atg ctc aga gcg ctt 206
 Leu Leu Arg Val Lys Ser Ser Glu Arg Leu Ala Met Leu Arg Ala Leu 30
 30 35 40
 gca gga atg tgc ggt cac cgc gtc ctt cct ggc act ggt gct tct gcg 254
 Ala Gly Met Cys Gly His Arg Val Leu Pro Gly Thr Gly Ala Ser Ala 45
 45 50 55 60
 ata gcg gca acg gta acc cca aag ggg gct tcg atg aag ctt aaa cca 302
 Ile Ala Ala Thr Val Thr Pro Lys Gly Ala Ser Met Lys Leu Lys Pro 65
 65 70 75
 ccg cgt ccg cag tca acg aag tct ccg gag ctc agg gag ctg tca cgg 350
 Pro Arg Pro Gln Ser Thr Lys Ser Pro Glu Leu Arg Glu Leu Ser Arg 80
 80 85 90
 aag att cgc gaa atg aat aag act ata agt cag gaa tca gct cgg gta 398
 Lys Ile Arg Glu Met Asn Lys Thr Ile Ser Gln Glu Ser Ala Arg Val 95
 95 100 105
 aac cac cgg ttg ccg gaa ggc cac cct ctc tta gag aag cgg gca gaa 446
 Asn His Arg Leu Pro Glu Gly His Pro Leu Leu Glu Lys Arg Ala Glu 110
 110 115 120
 tat ttc gtc acc tta gat ctc tta aga gcc aag gag tca ata gac tca 494
 Tyr Phe Val Thr Leu Asp Leu Leu Arg Ala Lys Glu Ser Ile Asp Ser 125
 125 130 135 140
 tct aag aag gca cta cgt agg tac cgt gcc tct atg agg aat acg aac 542
 Ser Lys Lys Ala Leu Arg Arg Tyr Arg Ala Ser Met Arg Asn Thr Asn 145
 145 150 155
 cga cta gtg cac aat aga cga cca gtt cta cca aag gta gag cct gac 590
 Arg Leu Val His Asn Arg Arg Pro Val Leu Pro Lys Val Glu Pro Asp 160
 160 165 170
 tct aat cta cca ttc ggc cag cga cgg agt cgc atg aca acg tgg aat 638
 Ser Asn Leu Pro Phe Gly Gln Arg Arg Ser Arg Met Thr Thr Trp Asn 175
 175 180 185
 ctt aga cca cgc cgg acg ggt tat ccg tca aat ggt act ttg gca gtt 686
 Leu Arg Pro Arg Arg Thr Gly Tyr Pro Ser Asn Gly Thr Leu Ala Val 190
 190 195 200

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acg gaa ctc ctg atc tcg att tat aga tca aac ttc tac acc ttg aag 734
Thr Glu Leu Leu Ile Ser Ile Tyr Arg Ser Asn Phe Tyr Thr Leu Lys
205 210 215 220

gtg gtc gag gaa ggg aga tgt acg tgc tgc aac acc cat aag gag caa 782
Val Val Glu Glu Gly Arg Cys Thr Cys Cys Asn Thr His Lys Glu Gln
225 230 235

gct ttg cta ctc cta tcc ggt tac ctc cag cta tat cgt gca ctg cac 830
Ala Leu Leu Leu Leu Ser Gly Tyr Leu Gln Leu Tyr Arg Ala Leu His
240 245 250

tca gtt gga agg tct gta ttc gta gaa tac tgc aaa acc agg ata tgc 878
Ser Val Gly Arg Ser Val Phe Val Glu Tyr Cys Lys Thr Arg Ile Cys
255 260 265

gtc gag gca cgc ctc acc gga cta cgt ccg agg gtg acc cta acg ggc 926
Val Glu Ala Arg Leu Thr Gly Leu Arg Pro Arg Val Thr Leu Thr Gly
270 275 280

tgc tgaactaggt tcagccagcg cttcctgtga gtatgtcatt ccgggtcctt 979
Cys
285

cggggcccgg gccagtttcg actggtgtag gtttgcccta ctagagtact tgcgacgccg 1039

aagcgctcc gttcaaaaga acgcgcaagc ctagcagag aaatgcgagg gcatgactct 1099

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<210> 4
<211> 285
<212> PRT
<213> Babesia canis

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20 25 30

Lys Ser Ser Glu Arg Leu Ala Met Leu Arg Ala Leu Ala Gly Met Cys
35 40 45

Gly His Arg Val Leu Pro Gly Thr Gly Ala Ser Ala Ile Ala Ala Thr
50 55 60

Val Thr Pro Lys Gly Ala Ser Met Lys Leu Lys Pro Pro Arg Pro Gln
65 70 75 80

Ser Thr Lys Ser Pro Glu Leu Arg Glu Leu Ser Arg Lys Ile Arg Glu
85 90 95

Met Asn Lys Thr Ile Ser Gln Glu Ser Ala Arg Val Asn His Arg Leu
100 105 110

Pro Glu Gly His Pro Leu Leu Glu Lys Arg Ala Glu Tyr Phe Val Thr
115 120 125

Leu Asp Leu Leu Arg Ala Lys Glu Ser Ile Asp Ser Ser Lys Lys Ala

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130

135

140

Leu Arg Arg Tyr Arg Ala Ser Met Arg Asn Thr Asn Arg Leu Val His
 145 150 155 160
 Asn Arg Arg Pro Val Leu Pro Lys Val Glu Pro Asp Ser Asn Leu Pro
 165 170 175
 Phe Gly Gln Arg Arg Ser Arg Met Thr Thr Trp Asn Leu Arg Pro Arg
 180 185 190
 Arg Thr Gly Tyr Pro Ser Asn Gly Thr Leu Ala Val Thr Glu Leu Leu
 195 200 205
 Ile Ser Ile Tyr Arg Ser Asn Phe Tyr Thr Leu Lys Val Val Glu Glu
 210 215 220
 Gly Arg Cys Thr Cys Cys Asn Thr His Lys Glu Gln Ala Leu Leu Leu
 225 230 235 240
 Leu Ser Gly Tyr Leu Gln Leu Tyr Arg Ala Leu His Ser Val Gly Arg
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 275 280 285

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 <211> 90
 <212> DNA
 <213> Babesia canis

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 ctttgttgcc gagaaccgtc ccacctttgg 90

<210> 6
 <211> 24
 <212> DNA
 <213> Babesia canis

<400> 6
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<210> 7
 <211> 21
 <212> DNA
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<400> 7
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<210> 8
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 <212> DNA
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<210> 13 <211> 21 <212> DNA <213> Babesia canis	
<400> 13 agggagctgt cacggaagat t	21
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<210> 16

<211> 88

<212> DNA

<213> Babesia canis

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<210> 17

<211> 22

<212> PRT

<213> Babesia canis

<400> 17

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Ser Lys Lys Ala Leu Arg
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